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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/673,230	06/16/2003	Paul D. Lusk	960067.ORI	3805
7590 07/24/2006				
Nikolai Mersereau & Dietz 820 International Centre 900 Second Avenue South Minneapolis, MN 55402-3813			EXAMINER MITCHELL, KATHERINE W	
			ART UNIT 3677	PAPER NUMBER

DATE MAILED: 07/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/673,230	LUSK ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Katherine W. Mitchell	3677	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 June 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 25, ~~27~~ 33, 36, 37 and 39-42 is/are pending in the application. *kwm*
- 4a) Of the above claim(s) 28-33 and 42 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27 is/are allowed. *kwm*
- 6) ☒ Claim(s) 22-25, ~~27~~, 36, 37, 39-41 is/are rejected. *kwm*
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

The request filed on 6/12/2006 for a Request for Continuing Examination (RCE) under 37 CFR 1.114 is acceptable and an RCE has been established. Any previous finality is hereby withdrawn and a new action on the merits follows. Any newly-submitted claims have been added. An action on the RCE follows.

### ***Claim Objections***

1. Claim 27 is objected to because of the following informalities: In line 4, "consisting" should be followed by --of--. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claims 22-25 and 36,37,39-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
  - Claim 36 is rejected as indefinite, as "sufficient physical workability properties" is not clear - what is sufficient? What properties are "workability properties?"
  - Claims 22-25 are rejected as depending from rejected claims.
  - Claim 37 recites "free of high energy plasticizers" and also " a minor fraction of non-energetic plasticizer". Then dependent claims 39,40, 41 refer to "said plasticizer". Since two separate plasticizers are in the parent claim, the dependent claims are unclear due to improper antecedent basis.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 36 is rejected under 35 U.S.C. 102(b) as being anticipated by Dillehay et al, USP 5487851

**Examiner notes -- Applicant is claiming only one thing - a non energetic plasticizer. Other than the preamble defining “a non-energetic plasticizer”, the only requirement is that it be selected from the choices listed.**

Dillehay teaches an efficient non-energetic plasticizer, including ATEC, in col 3 line 66-col 4 line 3:

Typical nonenergetic plasticizers include triacetin, acetyltriethylcitrate (ATEC), dioctyladipate (DOA), isodecylperlargonate (IDP), dioctylphthalate (DOP), dioctylmaleate (DOM), dibutylphthalate (DBP), or mixtures thereof.

Since the teaching is for ATEC, inherently it will have the properties of ATEC and can be used as applicant uses ATEC.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 22-26 and 34-37,40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schumacher USP 5218166 in view of Elrick USP 4029529 and Plunguian USP 3451883 and Yunan USP 5187320.

Schumacher discloses a non-energetic plasticizer suitable for plasticizing high Nitrogen content nitrocellulose in a DNT-free single base propellant formulation. Abstract, col 4 lines 11-27). The formulation is capable of being used in a propellant capable of firing some type of projectile (col 1 lines 14-20). The plasticizer consists of material selected from ATEC, acetyltri-n-butyl citrate, triethyl citrate, tributyl citrate, diisobutyl adipate, diisooctyl adipate, and mixtures thereof (see additional references below for specifics), such that the non-energetic plasticizer enables substitution of a smaller amount of said plasticizer for all high energetic plasticizers, including DNT. First, examiner notes that in an apparatus claim, as long as the claimed structure is capable of performing the intended use, the limitation is considered to be met. Further, if the same compound is disclosed, it is assumed to inherently have the same properties, such as enabling substitution of a smaller amount. Stabilizers including ethyl centralite are taught in col 8 lines 3-6.

Stabilizers such as 2-nitrodiphenyl amine, diphenylamine, ethyl centralite or the like are also found to be within the scope of the present invention.

Schumacher teaches 13.2-13.4 wt % N nitrocellulose as a major fraction component, which is greater than 13.15% wt N in col 4 lines 11-20, a non-energetic plasticizer (col 8 lines 20-22) as a minor fraction component and has no DNT. However, Schumacher does not teach the specified non-energetic plasticizer.

Elrick teaches that multiple plasticizers for nitrocellulose can be used together including phthalates and adipates, (col 4 lines 5-16) and that ethyl centralite is a known nitrocellulose stabilizer. (col 5 lines 1-3) (claim 29)

Plunguian and Yunan teach that among the many possible plasticizers for nitrocellulose are diisobutyl adipate and dibutyl phthalate (Plunguian -- col 4 lines 20-42) and acetyl triethyl citrate (ATEC) (Yunan -- col 4 lines 18-30)

Therefore, it would have been obvious to one of ordinary skill in the art, having the teachings of Schumacher and Plunguian and Yunan before him at the time the invention was made, to modify Schumacher as taught by Plunguian and Yunan to include the alternate well-known non-energetic plasticizers of Plunguian and Yunan, since they will perform in the same manner and are well known alternatives. It would also have been obvious to one of ordinary skill in the art, having the teachings of Schumacher and Elrick before him at the time the invention was made, to modify Schumacher as taught by Elrick to include multiple plasticizers and substitute ethyl centralite for the diphenylamine as the stabilizer, since they will perform in the same manner and are well known alternatives.

7. Claims 39,41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schumacher in view of Elrick USP 4029529 and Plunguian USP 3451883 and Yunan USP 5187320 as applied above and further in view of common knowledge in the art as evidenced by Dillehay et al USP 5565150. As discussed above, Schumacher in view of Elrick and Plunguian and Yunan teach all the elements except that the plasticizer contains a major fraction of ATEC. ATEC is well-known as a plasticizer for cellulose,

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as evidenced by the definition of ATEC cited in the references, and Dillehay further teaches in col 4, copied below:

-----  
Energetic and nonenergetic plasticizers may be used, depending on whether low energy (LE) or high energy (HE) gun propellants are desired. Known and novel energetic plasticizers may be used, such as bis(2,2-dinitropropyl)acetal/bis(2,2-dinitropropyl)formal (BDNPF/BDNPA), trimethylolethanetrinitrate (TMETN), triethyleneglycoldinitrate (TEGDN), diethyleneglycoldinitrate (DEGDN), nitroglycerine (NG), 1,2,4-butanetrioltrinitrate (BTIN), alkyl nitroethylnitramines (NENA's), or mixtures thereof. Typical nonenergetic plasticizers include triacetin, acetyltriethylcitrate (ATEC), dioctyladipate (DOA), isodecylperlargonate (IDP), dioctylphthalate (DOP), dioctylmaleate (DOM), dibutylphthalate (DBP), or mixtures thereof. The gun propellant compositions processed according to the present invention typically include from 5% to 10% plasticizer, by weight.

that ATEC is a "typical nonenergetic plasticizer" and note that claim 17 of Dillehay is specific that it is used with nitrocellulose for propellants and explosives.

Applicant has provided no criticality or unexpected results for ATEC over any of the other known plasticizers for nitrocellulose, and it would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have selected a major plasticizer component to be ATEC, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious engineering selection from known alternatives. *In re Leshin*, 125 USPQ 416. ATEC would be desirable because of its low cost and wide availability and familiarity.

### ***Allowable Subject Matter***

8. Claim 27 is allowed, **subject to** the correction of the minor typing error above.

As allowable subject matter has been indicated, applicant's reply must either comply

with all formal requirements or specifically traverse each requirement not complied with.  
See 37 CFR 1.111(b) and MPEP § 707.07(a).

Applicant's arguments are persuasive regarding this claim, which claims a single base propellant free of high energy plasticizers comprising by weight specific amounts and compounds.

### ***Response to Arguments***

9. Applicant's arguments filed 6/12/2006 have been fully considered but they moot in view of the new grounds of rejection. However, examiner notes that applicant is arguing features not claimed - solubility in specific compounds and efficiency of a specific compound would inherently be the same if all that is claimed is that compound. Method claims, or claims to a specific combination of compounds, may find support in that argument, but not claims to a compound **capable of** certain uses.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine W. Mitchell whose telephone number is 571-272-7069. The examiner can normally be reached on Mon - Thurs 10 AM - 8 PM.

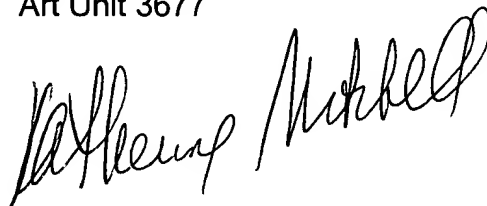
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, J. J. Swann can be reached on 571-272-7075. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Katherine W Mitchell  
Primary Examiner  
Art Unit 3677

A handwritten signature in black ink, appearing to read 'Katherine W Mitchell', written in a cursive style.

Kwm  
7/17/2006